For a Safer World

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At this very moment, somewhere in the world the ground is shaking violently. In other places, wind is whipping up water to a froth and permeating the air with turbulence as devastating storms wipe out roads, bridges and large areas of land, even villages, causing havoc and destruction all around.

In complete contrast, there are places on other parts of the globe where nothing seems to be moving. Life itself seems to come to a halt, paralyzed by the dead hand of drought, which has imposed an all-embracing curfew.

Neither are humans spared. When such natural catastrophes occur where people live and work, there is always the ripple effect of human disaster. In fact, hardly a week goes by without media reports of natural disasters — typhoons, floods, volcanic eruptions, freezing cold and other extreme weather events which cause thousands of deaths and millions of dollars worth of damage.

Global Disaster Trends

During the 1980s, more than 700,000 people lost their lives as a direct result of severe weather, including floods and droughts. The 1990s are proving even more calamitous, as global natural disaster trends rise with increasing rapidity. Among the different types of natural disasters, floods, tropical storms, droughts and earth-quakes are the most destructive, followed by landslides and storms. Several million victims have suffered homelessness, disaster-induced ill health, severe economic losses and personal tragedies.

In 1992 alone, natural disasters cost the world economy more money than it spent on development aid. The damage and costs inflicted by natural disasters spread well beyond the immediate regions affected, to countries as a whole and often to the wider global community.

The demands of a rapidly expanding world population are placing increasing burdens on our planet's resources. United Nations projections estimate that the world's population will reach ten billion by the year 2050. This means that the potential effect of disasters on human life is also growing, since population pressures will lead more people to live and work where risks are highest (e.g., river valleys and coastal lowlands).

In addition, some natural disasters are inadvertently amplified by man's activities; for instance, deforestation of mountain areas increases the intensity of floods. And then there is the additional problem of the changing climate and the sealevel rise expected to accompany it. A rising sealevel will aggravate the risk for populations living in coastal areas, while shifts in the major climate belts may bring severe storms and other extreme weather events to areas where they have not been prevalent before.

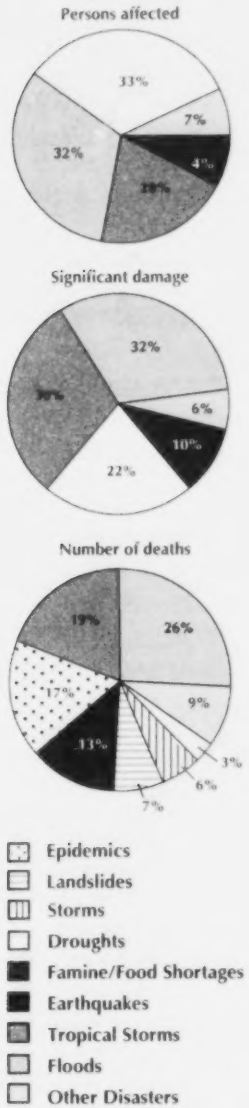
The Impact on Society

Humanity has not conquered nature; on the contrary, people and whole societies often fall victim to nature's unleashed fury. Considered purely from a financial point of view, the cost of weather-related natural disasters is estimated at about US$50-60 billion per year.

The overall impact of a disaster on a given country, and its ability to recover from the resulting human and material damage, depends on several factors. A hurricane, for example, may have a disastrous effect on a country with a small population and a weak economy, whereas a disaster of similar magnitude (e.g., an earthquake) in another country with a strong economy and large population might not cause serious socioeconomic disruption in the national context. Even so, it is imperative for long term development that the far-reaching effects of natural disasters be mitigated.

Major disasters around the world 1963-1992

% of significant disasters by type



Source: Disasters Around the World—A Global and Regional View. Information Paper No. 4 (April 1994), World Conference on Natural Disaster Reduction, Yokohama, Japan, 23-27 May 1994. United Nations Department of Humanitarian Affairs.

The enormous physical consequences of natural disasters and the huge financial cost of relief efforts, compared to prevention, makes disaster reduction a condition for sustainable development which requires that we plan so that the needs of future generations can be met, while we satisfy those of the present.

Shifting from Relief to Preparedness

The arguments for improving all countries' capabilities to combat natural disasters are compelling. No nation can afford to ignore the growing threat. No community can expect to be fully free from the increasing danger. The most important challenge is to change from concentrating solely on post-disaster relief and to focus on pre-disaster preparedness.

Thanks to disaster-preparedness schemes, particularly to an increasingly sophisticated early warning system, the comparative losses of life due to weather-related disasters are declining. All the evidence shows that, for every dollar spent on prevention and preparedness, about $100 or more is needed for relief efforts after the disaster has taken place.

Nowhere are these very favourable cost—benefit ratios more obvious than in the applications of meteorology and operational hydrology. For example, the cost of constructing disaster-resistant buildings adds only 2 to 12 per cent on average to the normal costs, as compared to far larger replacement costs. Studies of forecasting and warning systems demonstrate that cost—benefit ratios of 1:10 or even 1:15 are common.

With the costs of natural disasters continually mounting, countries which have invested in proficient integrated disaster management systems are already seeing returns on their investments.

Where such forecasting and warning systems are installed as part of disaster-management programmes, evidence shows that more lives can be saved and damage drastically reduced. For example:

- **Japan:** Since the introduction of meteorology and operational hydrology systems to Japan in the 1960s, the annual loss of lives from typhoons, floods, landslides and related events has been reduced enormously.
- **Jamaica:** When Hurricane Gilbert hit Jamaica on 12 September 1988, it was one of the most severe storms in the island's history. But Gilbert had been tracked by the United States National Hurricane Centre in Miami. Thus, Gilbert's path was predicted, timely warnings were issued and countermeasures taken by civil defense authorities. The result was a much lower death toll than when a similar hurricane struck in 1951.

The Role of WMO

Disasters of the fluid Earth are the major concern of the World Meteorological Organization (WMO), together with those where meteorology and operational hydrology are contributing factors. Forest fires, insect plagues and similar infestations fall under the latter category, but WMO also deals with seismological data and tsunami warnings.

Common to most, if not all, of these phenomena is the need to collect observations on a continuous basis and to process these data, in order to provide forecasts and to issue warnings where needed.

For meteorology, these are the responsibility of the national meteorological services, whose activities are integrated globally under the auspices of the World Weather Watch (WWW), established in 1967 as the global system for collection, exchange and processing of weather data and for the exchange of weather information.

Each day, over 20,000 weather stations make observations from the ground, the sea, the air and even outer space. These are transmitted as some 25 million data characters by high-speed telecommunications links through three global, 31 regional and 170 national centres with 2,500 weather charts for the preparation of weather analyses and forecasts.

Thanks to the wider availability of state-of-the-art technologies and the application of research results, the annual death toll from tropical cyclones and tornadoes has decreased over the years:

- Whereas fifteen years ago there were advance warnings for only 45 per cent of tornadoes, today's figure is 89 per cent.
- Although 1,400 North Americans lost their lives from tornadoes during the ten-year period from 1950 to 1959, during the decade ending in 1992, the death toll dropped to 521. A similar trend applies to hurricanes and tropical cyclones.

These developments are a direct result of improvements in the science and technology of detection and prevention, advances in communications technologies, increased cooperation between officials, non-governmental organizations and the media, and the planning and implementation of pre-disaster activities and organized evacuations.

The Challenge: Early Warning for All

During the recent United Nations–sponsored World Conference on Natural Disaster Reduction in Yokohama, Japan in May 1994, the Secretary-General of the World Meteorological Organization (WMO), Professor G. O. P. Obasi, declared: "To make warnings universally available by the twenty-first century is an achievable goal for all countries, that would require only a modest investment."

Although the world today is a safer place because of capabilities to forecast impending disasters and warn populations, according to Professor Obasi, this capability is limited to only certain types of natural disasters. In many parts of the developing world, countries are less protected by forecasting and warning systems than they should be.

Great efforts will be needed to extend to developing countries the network of meteorological and hydrological systems that currently protect industrialized countries from extreme weather-related disasters.

Disasters need not remain the scourge they were over the centuries. Science and modern technology offer a viable means of disaster prevention and reduction. However, the goal of a safer world for all in the twenty-first century will remain but a dream unless countries channel more of their basic resources towards strengthening and improving their early warning systems.

For further reading:

A Decade Against Natural Disasters, WMO No. 799, Geneva, 1994.

The Role of the World Meteorological Organization in the International Decade for Natural Disaster Reduction, WMO No. 745, Geneva, 1990.

Hydrology and Meteorology for Sustainable Development, WMO No. 769, 1992.

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